Repair of Exakta 6x6, 2 1/4”, Single Lens Reflex

Exakta 6x6
No. 602246

Access to Film Counter & Winding Mechanism

For convenience remove the lens. The lens release is on the left side of the camera and just to the rear of the lens. Hold the button back and turn the lens counter clockwise.

Lay the camera with the right side up and the rear to your left as in the figures. All the screws are right hand thread. Remove the screws in the shutter speed dial and the delayed action knob. Unscrew the two-holed spanner nut in the delayed action knob. Remove the flat spanner screw (counter reset button) just below and in front of the speed dial, and below that the release button locking lever. For the winding key remove the center screw and then the spanner nut underneath (as normal this spanner nut has two holes in it for a wrench. But note that one of the holes has a very small set screw in it to lock its position. Mark the position of the nut, loosen the set screw and unscrew the nut). Around the outer edge of the cover plate there are six flat head screws which show through the leatherette. If these screws have green material (interaction between brass and grease in the leatherette on the cover plate) around them, they should be cleaned before reinstalling. Remove all six.

Caution: When lifting off the cover plate do not lift the gear (winding gear under the winding key) enough to unmesh it from the other gears.

Viewing the gears

Set the camera with its base facing you, and the lens opening to the right.

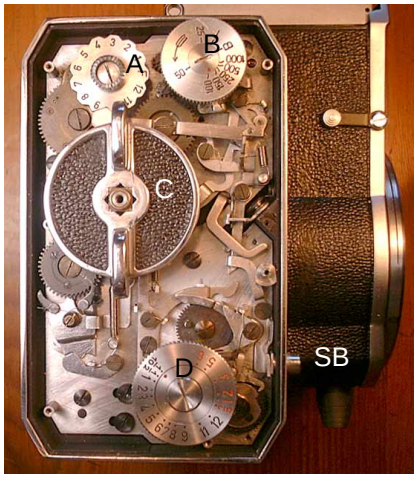

Fig. 1.

Figure 1, shows the mechanism, with the outside dials and knobs replaced. To the top left is the Exposure Counting Wheel (A), to the the top right is the Shutter Speed Dial (B). In the middle is the Cocking Wheel/ Winding Gear (C) and below that and to the right is the Time Delayed Action Dial (D). To its right is the shutter release button (SB)

Figure 2, shows the same gears with the knobs removed. Now an intermediate gear (E) between the winding gear (C) and that drives the film counting dial, can be seen. Also, a double intermediate gear (F) between the winding gear and the film speed gear (B). Below and to the left of the winding gear is a gear (G) and a lower ratchet mechanism (H), that stops double exposures. This is all in the uncocked position.

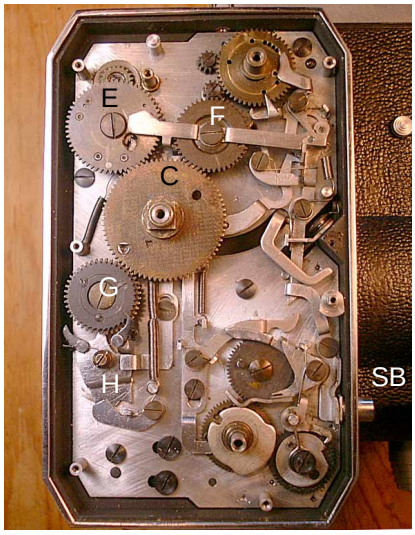

Fig. 2.

Counter & Winding Gears (Retiming)

General:- If retiming of the gears becomes necessary, begin by removing the winding gear (C), the counter dial (A) and the gear (E) between the dial and the winding gear. Remove the gear (G) with the double ratchet just below and slightly behind the winding gear. Replace the speed dial (B) and set it to Bulb. Turn the dial counter clockwise (there is an arrow indicating the correct direction) until the mirror is lowered into viewing position and the shutter is cocked. Just below the speed dial is a horizontal bar (L. Fig. 3) which locks the shutter-releasing linkages. Push the front of this bar up enough so that the shutter release button can be pushed (Fig 2. SB).

Cock and release the shutter a number of times while noting its action.
On the underside of the winding gear (C) is a positioning (stud) pin (Fig 3, C. See triangular mark on its the bottom left). With the shutter in released position, set the winding gear on its post with that bottom stud counter clockwise as far as it will go (against a substantial stud in the underlying mechanism plate) - as in Fig. 3. At this position, mesh the winding gear with the intermediate gear (E) between the winding gear and the speed dial gear. You can now set the winding key on its square post and wind, and release the shutter.

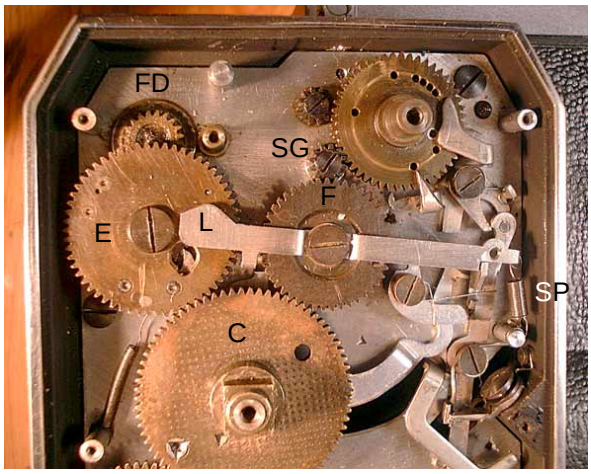

Fig. 3.

Replace the ratchet gear (G. Fig. 2) which meshes with the winding gear at 7 o'clock. Just below this gear is a bracket (H. Fig. 4) which is positioned by two spring loaded toggles. That bracket has a upward pointing curved arm (not shown - hidden by gear G). When replacing the ratchet gear, its position must be such that the pin on its lower side when rotated to maximum counter clockwise, strikes the upper end of the bracket arm, causing it to pivot to the right. When this happens the left ratchet will engage the bottom teeth on the gear and prevent further motion of the winding gear when it returns to rest - until the shutter is released. More on this below. Before replacing the gear it is advisable to scribe the position of the lower pin on the upper surface (see mark on G in Fig. 4)

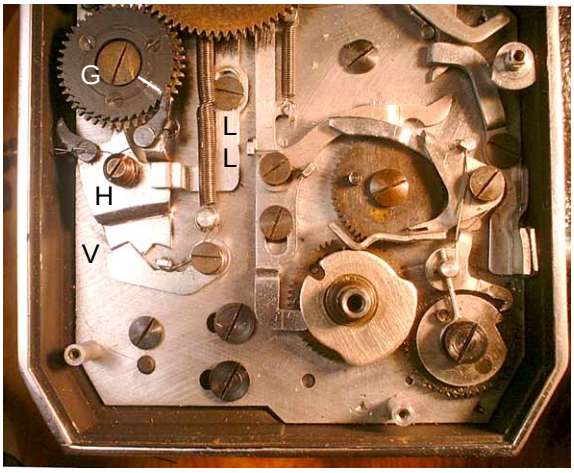

Fig. 4.

When the shutter is released, the gear rotates clockwise and the bracket moves back into its former position. The bracket is held in either of its two positions by the V-notches on its bottom end (V). The mesh of this ratchet gear to the winding gear (C) must be very precise.

If it doesn't turn far enough on cocking, the pin on its bottom side will not pivot the bracket to the right. Then the right ratchet toggle will not disengage, and the winding gear cannot return to the rest position. On the other hand, if it turns too far it will engage the left and lower ratchet toggle before the shutter and mirror are fully wound. Again, the meshing of all the gears must be very exact. One tooth can mean the difference between the mechanism working properly, or not at all. In the uncocked position, it is advised to position the gear with its pin very close to the right hand ratchet as shown by the mark in Fig 4, before beginning precise adjustment. More about this all later.

It is advisable to check all the teeth of this gear - there may be considerable wear and spalling - clean up as necessary.

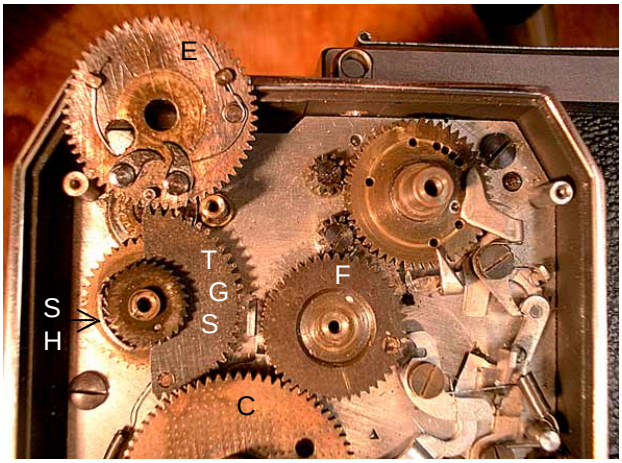

Fig. 5.

Counter gear:- timing of the counter gear is the most difficult of all. It is here that many problems occur, since the force of the winding gear on the film take-up roller drive gear (FD, seen at 12 o'clock under the counter intermediate gear (E, Fig. 2) has caused wear. If there is any spalling (fraying) of the gear teeth, these should be smoothed off with very fine abrasive paper and polished.

Fig. 5, shows the gear underneath the intermediate gear (E) which has an upper ratchet gear, a thin gear segment (TGS), and a lower intermediate gear that drives the film take-up roller drive gear (FD. Fig 3) On the side opposite of the teeth of the thin gear segment is a partial curved raised extension about 3/8" long, which comes above the teeth of the upper ratchet gear. This is referred to as the segment hub (SH). On the bottom of the intermediate gear (E - shown upside down in Fig. 5)), there are two ratchet toggles.

Notice the gear on the back side of the counter dial (A. Fig. 1) and how one half of a gear tooth is cut away - look closely. Notice that the intermediate gear (E) has a 1/8" hole in it, just over one of the ratchet toggles.

Making sure that the springs are in proper position on the toggles on the bottom side of the intermediate gear, place the gear on its post with the hole in at approximately the 6:30 position. You will have to reach through the hole with a prick and hold the ratchet toggle back so that it can go down over the top ratchet gear.

If you have the gear positioned properly, the other toggle on the bottom side will be seen sticking out from under the gear at 9 o'clock. With the prick, reach underneath the intermediate gear and turn the thin gear segment (TGS) so that the cutout edges are facing straight up and down and the teeth are facing toward the right (as in Fig. 5). While holding the segment in this position, place the counter dial on the post with numeral 4 slightly past 12 o'clock. On the underside of the counter dial, and positioned between numerals 3 and 4, is a stop pin which, when the dial is turned counter clockwise, will come to rest against the post under numeral 4. This post is fastened into the underlying mechanism plate. With the gear segment in the above position, lower the dial into position, meshing the gear on its bottom side with the gear segment and the film take-up drive gear. Notice the outside of the counter dial – its edge has shallow V's cut between each number, forming a cam. The bar (Fig 2, L) mentioned before (which locks the release linkage) is controlled by this counter dial cam. The follower on the left end of the bar fits into the V's in the dial and leaves the release linkage in the release positions, except when the last frame has been exposed. Then the follower drops into the deeper V between the 9 and 10 numerals and locks the release linkage at the other end.

If the intermediate gear (E) is positioned correctly with the gear segment and segment hub in the V between numerals 10 and 11, then you should be able to look though the hole in the gear and see the toggle engaged with the ratchet, and the toggle just clearing the lower end of the segment hub.

There is a good reason for the segment hub. As the take-up film roll gets larger with every frame, the roller has to be turned less. Each time the film is wound and the wind gear returns to the rest position, the ratchet toggle backs up farther. On each successive winding cycle, the segment hub holds this toggle out of engagement with the ratchet for a longer period of time.

One more thing to mention is the advancing of the counter dial. On the bottom of intermediate gear (E) there are the two previously mentioned toggles. One is for the lower ratchet gear. The other, which rests at the 9 o'clock position underneath the gear, strikes the counter dial gear just enough to advance it one number. When the last frame is exposed and the red F shows in the window, the toggle falls into the cutout tooth in the dial gear that was mentioned before. If timing is off between the wind gear and the intermediate gear, the counter will either not advance or advance too much. In this case lift wind gear (C) just enough to allow turning the intermediate gear one or more teeth either way to make an adjustment.

Adjustment of the Anti-Double exposure gear (Fig 4.). See Fig 4. This gear (G) and its double ratchet toggle is operated by the winding gear. As the winding gear is turned clockwise to advance the film and cock the shutter, the gear (G) turns counter clockwise. The right ratchet stops the winding gear from being turned counter clockwise before a full cocking sequence is completed. As gear G turns, the pin on the underside engages the curved arm on the upper part of the toggle (not shown). This moves the toggle to the right and disengages the ratchet on the right and engages the left ratchet on the underside set of teeth as the winding knob reaches its full cocking motion clockwise. When the winding knob is then released and springs back to its original position, this disallows any further turning of the winding knob clockwise, hence stopping further film advance. The toggle is held in either of these two positions by V-shaped notches and a ratchet below (V). When the shutter is released, a long lever (LL, Fig. 4) lifts the double ratchet toggle up and to the left into its winding position to allow new film advance. That long lever is moved by a pin under the double intermediate gear (F. Fig. 3) between the winding gear and the shutter speed gear.
To see the upper end of that long lever the film counter lever (L, Fig 3) will need to be removed. Take care to replace the spring (SP). The gear F is double. The upper one has a lower pin that contacts a similar one on the bottom gear and these drive the lower gear that meshes with the small shutter gear (SG), which can be seen between the shutter speed gear and the double intermediate gear (Fig. 3).

Now the problem is that the underneath pin on the bottom gear must move the long lever at the end of the shutter release sequence. That is, the double intermediate gears move clockwise and that lower pin must contact the long lever and move it up enough so that its L-shaped lower end moves the double ratchet toggle (H. Fig. 4) to the left. If it does not, then gear (G) will jam the winding mechanism. If so, the lower intermediate gear (F) must be lifted and rotated clockwise one tooth (or more).
NB Doing the above might require resynchronising all the gears and this can be an iterative process.

Replacing the cover

When replacing the winding knob make sure that the two-holed locking ring is not tightened too much. The minute locking screw should be able to be completely screwed in. Otherwise the winding knob will bind against the cover and not move freely.

Adapted From: 564/SPT Service Notes, *Robert C. Voiles, Moses Lake, Washington*

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